Preparation of Fine Particulate Emissions Inventories

Chapter 3 – Onroad Mobile Sources

MOBILE 6 Overview

- Use MOBILE 6 model for emission factors
  - $PM_{2.5}$, SO_2, NO_x, NH_3, PM_{10}, VOC, and CO
  - $PM_{2.5}$ and PM_{10} emission factors are for primary emissions (PM2.5-PRI and PM10-PRI)
- Use vehicle miles traveled (VMT) data for activity
- Map VMT data to corresponding MOBILE 6 emission factors

MOBILE 6 Overview (cont.)

- Data and algorithms previously in PART5 (with updates where applicable) have been integrated into the MOBILE 6 model
- Fugitive dust emission factors included in PART5 (i.e., re-entrained road dust) removed from MOBILE 6
- MOBILE 6 also includes emission estimates for Gaseous SO_2 and Ammonia (NH_3)

MOBILE 6 Modeling Inputs

- Use same inputs for MOBILE 6 model as used for previous MOBILE 6 model for same time period
  - Registration distribution
  - Ambient conditions
  - Speeds/speed distribution
  - Fuel parameters
  - Control programs
  - VMT mix

MOBILE 6 Modeling Inputs (cont.)

- Additional data required for MOBILE 6
  - Diesel sulfur content (in parts per million [ppm])
- Additional commands needed for MOBILE 6
  - Described in MOBILE User's Guide
- $PM_{2.5}$ and PM_{10} emission factors cannot be calculated in same scenario—particle size must be specified in each scenario

National Mobile Inventory Model (NMIM)

- Creates national or sub-national emission inventories
- Consolidated emissions modeling system
- Combines a graphical user interface, MOBILE, NONROAD, and a data base
- Data base contains most recent information used in the NEI

National Mobile Inventory Model (NMIM) (cont.)

- Calculates criteria pollutants and HAP emissions
- All estimates based on same input parameters
- Used to generate preliminary 2002 NEI for nonroad engines
- Optional for states
- Available for general use in 2004
- Produces same results as MOBILE and NONROAD

Sources of VMT Data

- State Department of Transportation
- Metropolitan Planning Organization
- 1999 NEI VMT Data based on:
  - State-provided VMT (8 States)
  - FHWA HPMS data summaries
    - By roadway type and State
    - By roadway type and Urban Area
    - Nationally by Vehicle Type

VMT Approach

- Distributions of VMT by roadway type, vehicle type, by hour of day can be applied directly to VMT or included within MOBILE 6 input files
- Also need to have speeds matched to roadway types either as average speeds or as speed distributions by speed ranges

Level of Detail of VMT Data

- By county
- By roadway type (or link level)
- By vehicle type
- Appropriate time period

Calculating Onroad Emissions

- Match VMT to corresponding MOBILE 6 emission factor
  - Map according to speed, roadway type (RT), vehicle TYPE (VT), time period
- Emis= VMT * EF * K
  - Emis = emissions in tons by RT, VT
  - VMT = vehicle miles traveled on RT by VT in miles
  - EF = emission factor in grams/mile by RT, VT
  - K = conversion factor

Additional Resources

- User's Guide to MOBILE6.1 and MOBILE6.2: Mobile Source Emission Factor Model, EPA420-R-02-028, October 2002
  http://www.epa.gov/otaq/m6.htm
- MOBILE6.1 Particulate Emission Factor Model Technical Description, Draft, EPA420-R-02-012, March 2002
  http://www.epa.gov/OMS/models/mobile6/r02012.pdf
- Links to MOBILE6 Training Materials
  http://www.epa.gov/otaq/m6.htm#m6train